Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-3, 6, 7, 10, 11, 15, 16, 20, 21, 23-25 and 27-47 are pending in the application, with claim 1 being the independent claim. Claims 4, 8, 9, 12-14, 17-19, 22, and 26 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. New claims 40-47 are sought to be added. Claims 1, 23, and 27 are sought to be amended. These changes are believed to introduce no new matter, and their entry is respectfully requested. In particular, support for the new table added to claim 1 and claim 40 may be found on page 24 of the as-filed specification.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 102

Claims 1-4, 6-21, 25 and 29-36 are rejected under 35 U.S.C. § 102(e) as being anticipated by Lahm *et al.*, U.S. Patent No. 7,902,231 (hereinafter "Lahm"). (Office Action, page 2, lines 17-18). Applicants respectfully traverse this rejection.

It is stated:

> Lahm et al. disclose compounds of formula 1, which is nearly identical to applicant's formula (I), as it is more narrowly defined in applicant's claim 20 and in applicant's specific compounds I-1-1, I-1-4, I-1-9, I-1-12, I-1-24, I-1-52 and I-1-54. See Lahm's claim 1 & paragraph bridging

> columns 1-2. Lahm's claims 7, 12, 13 and 18 recite the compound that is applicant's compound I-1-4. Lahm's compounds 4, 20, 2, 22, 3, 7 and 5 correspond to applicant's [compounds] I-1-1, I-1-4, I-1-9, I-1-12, I-1-24, I-1-52 and I-1-54, respectively (Lahm's column 59; see also Tests A to L on columns 61-66). Lahm's compound of formula 1 is combined with at least one additional biologically active agent, wherein fipronil and ethiprole are specifically claimed (claims 3-4). The amount of the second ingredient is disclosed as an "effective amount" (column 56, lines 8-10), and the mixture of two pesticides provides broader spectrum of activity (column 56, lines 5-6). Methods for controlling pests or their environment is disclosed (claim 5; see also from bottom of column 51 to column 55). Protecting an animal from pest is disclosed (claim 6). Spraying, topical application, and various other application methods are disclosed (column 58, lines 21-38). Further incorporation of surfactant or diluents is disclosed (claims 8-11, 14-17). Rate of application is taught to depend on factors such as the species of pest to be controlled, pest's life cycle, size, time of year, host crop or animal, temperature, and other such factors; and the rate for "active ingredient" ranges 0.01-2 kg/hectare for agricultural purposes and 0.l-150 mg/m^2 for non-agricultural purposes (paragraph bridging columns 58-59). "One skilled in the art can easily determine the biologically effective amount necessary for the desired level of invertebrate control." (column 59, lines 3-5).
>
> Lahm et al. teach the same combination of two pesticides as claimed by applicant. Lahm's formula 1 is narrow enough to clearly envisage applicant's specified compounds in the dependent claims. Lahm's second pesticide list in claim 4 is small enough to clearly envisage ethiprole and fipronil, both of which are well known pesticides. Applicant's 200:1 to 1:200 ratio range in numerous dependent claims is noted, but such mixture ratio is so broad that Lahm's explicit disclosure is clearly within such ratio range. This is an anticipation-based ground of rejection, so applicant's declaration evidence of 6/1/2011 does not apply here. The claims are thereby anticipated.

(Office Action, page 2, line 19, through page 4, line 2).

Applicants respectfully disagree with these contentions. Lahm discloses no actual combinations of two active ingredients and discloses no ratios. Therefore, claims 1-4, 6-21, 25 and 29-36 cannot be anticipated by Lahm. Withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1-4 and 6-39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lahm. (Office Action, page 4, lines 10-11). Applicants respectfully traverse the rejection.

It is stated:

> Teachings of Lahm et al. were discussed above and the discussion there is incorporated herein by reference.
>
> Lahm et al. do not specify a mixing ratio of the two active ingredients, but the two pesticides have been taught as having pesticidal properties and Lahm et al. disclose effective amounts as being well within the skill of the ordinary skilled artisan. Applicant's claimed ratios of 200:1 to 1:200, 20:1 to 1:10, 5:1 to 1:5, 1:5, and 1:1 are noted.
>
> One of ordinary skill in the art would have found it obvious to combine the two active ingredients at concentrations and application rates at which the individual ingredients are known to be effective to arrive at an effective mixture ratio. Keeping in mind that Lahm et al. expressly teach the combination of fipronil or ethiprole and applicant's formula I compounds, the ordinary skilled artisan would necessarily have arrived at a mixing ratio. The ordinary skilled artisan would have found it obvious to combine the two known pesticides at the claimed mixing ratio range to obtain the claimed invention.
>
> Regarding applicant's specification and 6/1/2011 declaration data, it is the position of the Examiner that the data is

> insufficient against the near-identical teachings of Lahm et al. With respect to claims which have been found anticipated above, applicant's test data fails to outweigh the evidence of obviousness because Lahm et al. clearly disclose the combination of the two pesticides as claimed. With respect to the remaining claims that recite a specific ratio, the Examiner's position is the same but with additional comments as set forth below.
>
> For a given mixture of two pesticides, as taught by Lahm et al. in their patented invention, one of ordinary skill in the art would have found it obvious to combine the two pesticides at various ratios dependent on myriad factors such as target insect pests and other such considerations (see Lahm et al., column 58, lines 57-62). Because no pesticide or mixture of pesticides delivers its pesticidal activity in a perfectly linear dose-response manner, one of ordinary skill in the art would have had an expectation of variation in activity for the patented invention of fipronil + Lahm's formula 1 and ethiprole + Lahm's formula 1. Given this expectation, applicant's data is no more than the expected variation of activity when the two pesticides of Lahm's invention are combined as explicitly taught.
>
> Therefore, the claimed invention, as a whole, would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention and the claimed invention as a whole have been fairly disclosed or suggested by the teachings of the cited reference.
>
> For these reasons, all claims must be rejected at this time.

(Office Action, page 4, line 12, through page 6, line 3) (emphasis in original).

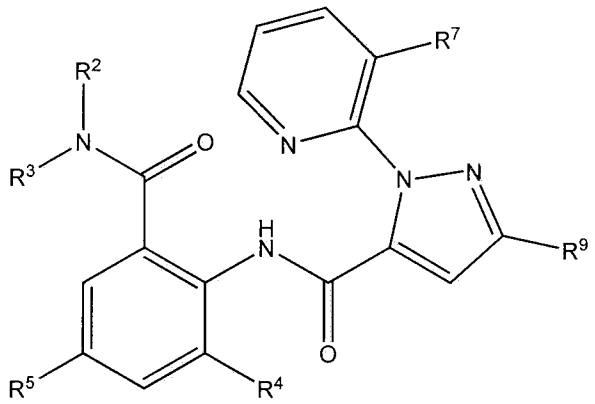
Applicants respectfully disagree with these contentions. Lahm discloses no actual combinations of two active ingredients and discloses no ratios. Even assuming, arguendo, that a *prima facie* case of obviousness has been established, which it has not, the synergistic

effects exhibited by the claimed invention are sufficient to rebut the *prima facie* case of obviousness.

Applicants respectfully direct the attention of the Examiner to the Declaration of Heike Hungenberg under 37 C.F.R. § 1.132 ("the Hungenberg Declaration") filed June 1, 2011. Examples A-D, described therein, provide evidence of the unexpected synergistic effects of the present invention.

In the Hungenberg Declaration, compounds of formula I-1 are referred to by compound number as listed in the as-filed specification. For simplicity, all compounds of formula I-1 that are in the Declaration are provided in Table 1 below.

Table 1: Compounds of formula I-1 in the Hungenberg Declaration



Compound No.	R^2	R^3	R^4	R^5	R^7	R^9
I-1-1	H	Me	Me	Cl	Cl	CF_3
I-1-4	H	Me	Me	Cl	Cl	Br
I-1-12	H	i-Pr	Me	Cl	Cl	Br
I-1-24	H	t-Bu	Me	Cl	Cl	CF_3
I-1-52	H	Me	Br	Br	Cl	CF_3
I-1-54	H	i-Pr	Br	Br	Cl	CF_3

In Example A of the Hungenberg Declaration, cabbage leaves heavily infested by green peach aphids (*Myzus persicae)* were dipped into preparations of test compounds I-1-4, I-1-54, I-1-1, I-1-24, I-1-12, ethiprole and fipronil. As indicated in the headings of Tables A1 and A2, the per cent mortality was measured for each test after 1 day and 6 days, respectively.

According to Tables A1 and A2, ethiprole and fipronil were tested in a 1:1 ratio with compounds I-1-4, I-1-54, I-1-1, I-1-24 and I-1-12. According to the Colby formula, the 1:1 combinations provided synergistic effects compared to when the single compounds were

tested. This is especially surprising since ***neither*** ethiprole ***nor*** fipronil exhibited ***any*** efficacy when tested alone.

In Example B of the Declaration, cabbage leaves were dipped in preparations of test compounds I-1-52, I-1-1, I-1-24, I-1-12, I-1-4, I-1-54, ethiprole, and fipronil, and the resulting leaves infested with mustard beetle larvae (*Phaedon cochleariae*). As indicated in the headings of Tables B1 and B2, the percent mortality was measured for each test after 2 days and 6 days, respectively.

According to Tables B1 and B2, ethiprole and fipronil were tested in a 1:1 ratio with compounds I-1-24, I-1-12, I-1-4, I-1-54, I-1-52, and I-1-1. According to the Colby formula, the 1:1 combinations of ethiprole and fipronil and the tested compounds provided synergistic effects compared to when the single compounds were tested. The results with the combination of compound I-1-12 and fipronil at application rate of 0.16 g/ha are especially surprising since compound I-1-12 exhibited ***no*** efficacy when tested alone at the same application rate. In addition, the results with the combination of compound I-1-4 and fipronil at application rate of 0.16 g/ha are especially surprising since compound I-1-4 exhibited ***no*** efficacy when tested alone at the same application rate.

In Example C of the Hungenberg Declaration, cabbage leaves were dipped in preparations of test compounds I-1-54, I-1-4, I-1-52, I-1-24, I-1-12, ethiprole, and fipronil, and the resulting leaves infested with fall armyworm larvae (*Spodoptera frugiperda*). As

indicated in the headings of Tables C1 and C2, the per cent mortality was measured for each test after 2 days and 6 days, respectively.

According to Tables C1 and C2, ethiprole was tested in a 1:1 ratio with compounds I-1-54, I-1-4, I-1-52, I-1-24 and I-1-12. According to the Colby formula, the combinations of ethiprole and the tested compounds provided synergistic effects compared to when the single compounds were tested. The results are especially surprising as ethiprole exhibited ***no*** efficacy when tested alone.

According to Tables C1 and C2, fipronil was tested in a 1:1 ratio with compounds I-1-54, I-1-52 and I-1-12. According to the Colby formula, the combinations of fipronil and the tested compounds provided synergistic effects compared to when the single compounds were tested.

In Example D of the Hungenberg Declaration, bean plants heavily infested by OP-resistant two-spotted spider mites (*Tetranychus urticae)* were dipped into preparations of test compounds I-1-24 and ethiprole. As indicated in the heading of Table D1, the per cent mortality was measured for each test after 6 days. According to the Colby formula, the combination of ethiprole and compound I-1-24 at a ratio of 1:1 provided a synergistic effect compared to when the single compounds were tested. These results are especially surprising as ***neither*** compound I-1-24 nor ethiprole showed ***any*** efficacy when tested alone.

Applicants also direct the attention of the Examiner to the accompanying Declaration of Elke Hellwege Under 37 C.F.R. § 1.132 ("the Hellwege Declaration"). In Example A

(paragraph 13), cabbage leaves were sprayed with preparations of test compounds I-1-4 and fipronil, and then infested with mustard beetle larvae (*Phaedon cochleariae*), and the percent mortality was determined after 3 days. As shown in Table A, according to the Colby formula, the combination of compound I-1-4 and fipronil at ratios of 5:1 and 1:5 provided a synergistic effect compared to when the single compounds were tested. These results are especially surprising since, when compound I-1-4 was applied alone at a concentration of 0.4 ppm, ***no*** efficacy was observed.

In Example B (paragraph 14), cabbage leaves were sprayed with preparations of test compounds I-1-4, ethiprole and fipronil, and then infested with the larvae of the diamondback moth (*Plutella xylostella*), and the percent mortality was determined after 3 days. As shown in Table B, according to the Colby formula, the combination of compound I-1-4 and ethiprole or fipronil at a ratio of 1:5 provided a synergistic effect compared to when the single compounds were tested. This is especially surprising since ethiprole exhibited ***no*** efficacy when applied alone.

In Example C (paragraph 15), cabbage leaves which are heavily infested by the green peach aphid (*Myzus persicae*) were sprayed with preparations of test compounds I-1-4, ethiprole and fipronil, and the percent mortality determined after 3 days. As shown in Table C, according to the Colby formula, the combination of the compound I-1-4 and ethiprole at a ratio of 5:1 provided a synergistic effect compared to when the single compounds were tested. In addition, the combination of the compound I-1-4 and fipronil at a ratio of 1:5 provided a synergistic effect compared to when the single compounds were

tested. This is especially surprising in view of the fact that ***neither*** ethiprole ***nor*** fipronil exhibited ***any*** efficacy when applied alone.

Thus, Applicants have demonstrated synergistic killing of insects with mixtures of a compound of formula (I) (I-1-4, I-1-54, I-1-1, I-1-24, I-1-12, I-1-52) together with ethiprole or fipronil over a range of ratios. These results are truly unexpected, and serve to overcome any basis for *prima facie* obviousness that the Examiner may assert.

For the reasons set forth above, Applicants respectfully request that the Examiner reconsider the evidence of unexpected effects presented in the specification and in the Declaration and that the rejection be withdrawn.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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